



# **Pollution Prevention [P2] and Pharmaceuticals in the Healthcare Industry**

for  
**New Mexico Healthcare Pollution Prevention  
Advisory Council**

Presented by:

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[PWD/WWU/p2 Program]

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# Objectives

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## 4 **Identify** the “drivers”

## 4 **Overview**

- Persistent Bioaccumulative and Toxic [PBT]

## 4 **P2** & pharmaceuticals in healthcare:

- Benefits
- Opportunities

## 4 **Review** strategies for “success”

# The “Drivers”

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## **4 Regulatory**

- Federal / State / Local

## **4 Corporate**

- Vision-Mission / economic / PR / insurance / liability

## **4 Industry**

- Standards / guidelines / agreements / accreditation / community outreach

## **4 Community**

- The public / interested parties

# Persistent, Bioaccumulative, and Toxic [PBT]

## What is a PBT Chemical?

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4 Pollutant chemicals that **persist** in the environment, are **toxic**, and **bioaccumulate** in food chains, posing risks to global ecosystems and human health; a.k.a. Persistent Organic Pollutants, POPs.





# PBTs and the healthcare industry

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## 4 Present:

- mercury

## 4 Future???:

- EPA target FY2003: endocrine disruptors
- pharmaceuticals as contaminants in waterways: antibiotics, hormones, analgesics, anti-inflammatory....
- low-level exposures resulting in harmful effects on aquatic species

## P2 Benefits: the business advantage

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### 4 P2 practices reduce or eliminate:

- \$\$\$costs of waste handling, treatment, storage, disposal, and associated labor
- civil and criminal fines
- permit fees
- insurance costs

4 Reduce regulatory burden

4 Decrease liability

4 Enhance public image

4 Effect of a positive corporate culture on staff

## **P2 Source Reduction Opportunities**

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- 4 Environmental [full-cost] accounting practices
- 4 Purchasing
- 4 Inventory control
- 4 Tracking of waste
- 4 Continuous improvement audits
- 4 Environmental training for all
- 4 Employee participation/suggestion programs

## Source Reduction: environmental accounting

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4 Actual cost of pharmaceutical = “unit” price of a pharmaceutical + costs associated with:

- storage of the product
- handling of returns [\$ in time/administrative/shipping]
- management of hazardous waste:
  - storage of wastes
  - transport of waste
  - disposal fees
  - labor of staff
  - training of staff
  - regulatory requirements
  - insurance

## **Source Reduction: purchasing/inventory control**

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- 4 Purchasing decisions incorporate environmental accounting principles
- 4 Purchasing system electronically connected to chemical management system allows for id of products [and RCRA waste codes where applicable?]
- 4 Centralized purchasing aids in a standardized inventory [reducing surprises on the waste end of the system]
- 4 Avoid standing re-orders [that may create storage issues and result in handling of returns]
- 4 JIT [reduce obsolete items and product storage needs]
- 4 Real-time inventory control [facilitated by barcodes]

## Beyond Source Reduction in P2: Waste minimization

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- 4 Training, training, training, and QA/QC at all program/ staff levels reduces potential for waste
- 4 Determination of status: material or waste? [RCRA]
  - Work closely with purchasing organization or reverse distribution company in returning non-dispensable pharmaceuticals to the manufacturers
  - Reverse distribution company may provide waste disposal service in addition to returns
- 4 Accurate characterization of waste [RCRA?]

## **Beyond Source Reduction in P2: Waste minimization**

[continued]

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### **4 Segregation of waste**

- RCRA + compatibility + ultimate waste disposal method

### **4 Waste containers: accessible / labeled / dated / inventoried**

### **4 Assignment of responsibility for compliance**

### **4 Methods that reduce potential for waste: OPs, vented enclosures, housekeeping**

### **4 Cleanup Procedures that reduce volume of cleanup materials**

### **4 Establish cooperative relationships with regulators**



# Waste minimization method: Reverse Distribution

## 4 Never intended to be a waste management tool

- Return non-dispensable product to manufacturers [expired, obsolete, and recalled products, and unused preparations]

## 4 Understand the level of service available

- Returns and/or actual waste management, i.e. can they service both, very different needs?
- Assist in waste characterization & training of staff?
- Capital Returns, Inc. Evaluation Criteria:  
[www.capitalreturns.com/EvalCriteria.htm](http://www.capitalreturns.com/EvalCriteria.htm)

## 4 Off-site vs. on-site service

- Which company takes on the role of waste generator?
- Off-site service takes responsibility for determination, characterization, and disposal of waste products not returned to the manufacturer

## 4 References from other client companies

# **Occupational Safety and Health Administration**

## **Controlling Occupational Exposure to Hazardous Drugs**

### **OSHA Technical Manual, Section VI, Chapter 2**

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- 4 OSHA guidance document based on American Society of Health-System Pharmacists class of agents identified as “hazardous drugs”
- 4 Hazardous Drug Safety and Health Plan program elements:
  - Operating procedures
  - Criteria for exposure control measures
  - Hazard Communication program per 1910.1200
  - Medical exams/surveillance of potentially exposed staff
  - Record keeping: exposure and biological monitoring; medical; training 1910.1020
  - Designate responsibility for implementation of the Plan

# What constitutes a pharmaceutical waste?

## 4 The following represent waste pharmaceuticals:

- IV preparations [biohazardous if contaminated]
- compounding
- spills
- partially used vials/syringes [biohazardous if contaminated]

## 4 EPA considers the following products until a decision is made to discard the material, at which time, it becomes a waste:

- outdated
- discontinued/obsolete
- unused repacks
- returns from patient rooms

## 4 Identification of sources of waste helps with source reduction and waste minimization

# Hazardous wastes: RCRA-regulated

“The Devil is in the details”

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## 4 Waste categories per 40 CFR Part 261:

- Characteristic: ignitability, corrosivity, reactivity, toxicity
- “Listed”: commercial chemical products found in “P” [acute hazardous waste] and “U” [non-acute] listings
- Category may apply to containers with residue, personal protective equipment and spill cleanup materials that have contacted waste

# Hazardous wastes: RCRA-regulated

[continued]

- 4 “Cradle to grave” responsibility/liability
- 4 Accumulation
- 4 Storage
- 4 Inspections
- 4 Transportation of waste:  
packaging/labeling/manifests/contractor
- 4 Treatment, storage & disposal of waste: licensed facility
- 4 Staff Training
- 4 Haz waste program:  
contingency/emergency/prevention
- 4 Record keeping/reporting

## Hazardous wastes: RCRA-regulated **EPA Generator Status?**

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### **4 Small Quantity Generator (SQG)**

- generate no more than 100 to 1000 kg/month (220-2,220 lbs)

### **4 Conditionally Exempt Small Quantity Generator (CESQG)**

- generate no more than 100 k/month (220 lbs)

**Every facility wants to be a CESQG!**

# Review strategies for “Success”

Define “success”: sustainability ... economics ... community relationships ...

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- 4 **Integrate** pollution prevention into business fabric
- 4 **Network** with local facilities [avoid re-invention]
- 4 **Develop** relationships with manufacturers, GPO's, regulators, chemical services contractors
- 4 **Train** all staff [this is a team effort]
- 4 **Inform** the community of facility's stewardship position



# Resources: Websites

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## 4 EPA

- Pollution Prevention: [www.epa.gov.p2](http://www.epa.gov.p2)
- Persistent, Bioaccumulative, Toxic Program: [www.epa.gov/pbt](http://www.epa.gov/pbt)
- RCRA training modules: [www.epa.gov/epaoswer/hotline](http://www.epa.gov/epaoswer/hotline)
- RCRA search: [www.epa.gov/rcraonline](http://www.epa.gov/rcraonline)

## 4 Hospitals for a Healthy Environment

- [www.h2e-online.org](http://www.h2e-online.org)

## 4 OSHA Technical Links: Hazardous Drugs

- [www.osha.gov/SLTC/hazardousdrugs/index.html](http://www.osha.gov/SLTC/hazardousdrugs/index.html)

# Resources: Organizations

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## 4 EPA

- RCRA Hotline: 1.800.424.9346
- Region VI: 1.214.665.6444
- Chemical Registry System: [www.epa.gov/crs/index.htm](http://www.epa.gov/crs/index.htm)

## 4 New Mexico Environment Department

- Expert Referral Services: 1.800.219.6157, x2831

## 4 Your Facility's Contractors

- Reverse Distribution
- Chemical Services / Hazardous Waste Management

## 4 NM-OSHA Consultation: 505.827.4230

## 4 H2E Environmental Leadership Council

- Catherine Zimmer, 612.624.4635

## **Resources: articles / reports / proceedings**

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- 4 **Pollution Prevention Workshop for Medical Facilities.** City of Albuquerque, Public Works Department, Wastewater Utility Division, Pollution Prevention Program. 4/2001.
- 4 **Healthy Hospitals: Environmental Improvements Through Environmental Accounting.** Tellus Institute. 7/2000.
- 4 **Bad Medicine, Managing Drug Waste Liabilities.** Charlotte Smith. *Health Facilities Management*. 1/ 2001.
- 4 **Hormone disruptors: A clue to understanding the environmental causes of disease.** Sheldon Krimsky. *Environment*. 6/2001.
- 4 **Pharmaceuticals, hormones, and other organic wastewater contaminants in U.S. Streams, 1999-2000: A National reconnaissance.** Dana Kolpin, et al. *Environmental Science and Technology*, 36 [6], 2002.